

## SYLLABUS

### Firearm Technologies for Law Enforcement, Engineers, Technicians, and Military

**COURSE NUMBER: GIQI003**

**Overview:** This course is for students who have already established a background in basic firearm fundamentals and ballistics. It is designed to advance their knowledge through presentation of the latest technologies in ballistics, performance measurement techniques, and advanced materials. This course is taught by three (3) experts, each with more than 40 years' experience in firearms and ballistics.

**Goals:** To present the relevant technologies and the mechanics of the most important function of firearms, ammunition, and the interaction between them. At course completion, the student will have gained an advanced technical knowledge of firearms, interior and exterior ballistics, ammunition, performance evaluation, and materials.

At course completion students will:

- Understand the mechanism of projectile launch, case obturation, powder burn and the basics of interior ballistics
- Have gained a full understanding of spin stabilization, ballistic coefficient, yaw, and other parameters of exterior ballistics
- Be able to explain what happens at the muzzle and the effects of muzzle attachments
- Recognize the importance of headspace with an understanding of how it is measured and functioning problems arising when boundaries are exceeded
- Recognize the importance of primary extraction as it relates to reliability
- Be able to explain recoil, free recoil energy, impulse, and firearm controllability
- Will know how barrels are manufactured, what materials are used, their respective advantages
- Will understand the mechanism of bore wear and barrel failure
- Understand the effects of barrel stiffness, vibration and barrel mounting
- Comprehend the difference between dispersion and accuracy and understanding target measurements
- Understand impact energy implications and terminal effects
- Recognize the types of failure modes common in firearms

# Gun IQ International LLC

**Lectures:** Courses are taught at an informal level with interaction between student and lecturer encouraged. This is a four-day course which can be successive days, paired days, or individual days. Courses can be in-person or virtual.

## **Texts and Related Course Material**

Each student will receive course study guide (optional)

## **Course Topics**

- Chamber interactions at time of projectile launch
- Interior Ballistics
- Exterior Ballistics
- System Accuracy Life
- Barrel Tube Structure & Design
- Mechanical & Heat Effects Elements of Bore Wear
- Barrel Materials
- Barrel Manufacturing Technologies
- Bore finishes
- Chambering
- OD Fluting
- Barrel Vibration
- Dispersion vs Accuracy
- Barrel Length Effects
- Crown Geometry
- Mechanical Dampers
- Barrel Mounting
- Free Floating Barrels
- Proof Firing
- Terminal Effects
- Common failure modes

## **Timing and Cost:**

Courses are offered in-person or virtually in four consecutive days or two, 2-day sessions. Pricing upon request.